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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/019,923	04/22/2002	Hardial Gill	P/63020-PCT	5730

7590

07/30/2004

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EXAMINER

JACKSON, BLANE J

ART UNIT	PAPER NUMBER
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2685

DATE MAILED: 07/30/2004

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/019,923

Applicant(s)

GILL ET AL.

Examiner

Blane J Jackson

Art Unit

2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>3</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 9-12 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson (GB 2078 038A) with a view to Goatcher (U.S. Patent 4,470,147).

As to claims 9, 11 and 12, Wilson teaches a mixer circuit for high frequency signals comprising:

Two double sideband mixers each being wired with identical first signals (RF input) and with second signals (LO input) phase-shifted by 90 degrees relative to each other in order to form a product signal from the first and second signals of each mixer figure 1, mixers (7) and (8), the LO input ports phase shifted for 90 degree difference),

An adder for superimposing the product signal from each mixer to form an output signal with one sideband (adder (21)), and,

Two amplifiers for generating the first signals, each amplifier being connected upstream of each mixer, the amplifiers having inputs connected to a same signal source via a forked line (figure 1, RF signal input split, a forked line shown, prior to amplifiers

(3) and (5), summary: an arrangement for an image rejection mixing arrangement, page 1, lines 5-54).

Wilson is silent as to the mixer circuit used for single sideband demodulation.

Goatcher teaches similar mixer topology but with an ADC for conversion to digital demodulation and processing suitable for phase modulation (PM), amplitude modulation (AM), frequency modulation (FM) or single side band modulation (SSBM) (figure 1, column 2, lines 31-67). Goatcher teaches the input carrier frequency is at the sideband centre frequency whereas the main transmission frequency of the other modulation types is at the carrier frequency (column 1, lines 16-36).

It would have been obvious to one of ordinary skill in the art at the time of the invention to recognize in the mixer circuit of Wilson the ability to receive and demodulate various types of signals as taught by Goatcher so as to provide a diverse mixer circuit ideal for a multimode receiver.

As to claim 2, Wilson teaches the signal source, upstream to the first signal split and amplifiers is a limiter (figure 1), but does not teach the signal source is an amplifier.

Goatcher teaches a RF amplifier prior to the first signal split and subsequent mixers (figure 1, column 2, lines 31-35). It would have been obvious to one of ordinary skill in the art at the time of the invention to realize in the circuit of Wilson the RF amplifier of Goatcher to provide a preamplifier prior to the mixing circuits to amplify the input frequencies to compatible levels to the mixers and to control the system noise figure.

As to claim 14, Wilson is silent as to the single sideband mixer circuit according to claim 9 further comprising a final amplifier for the product signal arranged between an output of each double sideband mixer and the adder (figure 1).

Goatcher discloses a mixer circuit where an amplifier is provided subsequent to each mixer (figure 1, column 2, lines 52-59). It would have been obvious to one of ordinary skill in the art at the time of the invention to alternatively modify Wilson modified with the base band I and Q amplifiers of Goatcher to adjust circuit signal levels for subsequent circuit compatibility.

As to claim 15, Wilson teaches an image rejection mixing arrangement for the purpose of fabrication on one or more semiconductor chips (page 1, lines 5-13).

As to claim 16 with respect to claim 12, Wilson teaches the adder is a second 90-degree coupler (figure 1, hybrid coupler (21) for combining mixer outputs, page 1, lines 84-89).

3. Claims ~~11 and~~ 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilson (GB 2078 038A) and Goatcher (U.S. Patent 4,470,147) with a view to Dydyk (U.S. Patent 4,457,022).

As to claims ~~11~~ and 13, with respect to claim 9, Wilson modified teaches where each first signal is a radio frequency signal and wherein each second signal is a local

oscillator signal and further comprising a first 90 degree coupler connected to a local oscillator input of the single sideband mixer circuit to generate the second signals (figure 1) but does not teach the first signal is a local oscillator signal and the second signal is an intermediate frequency signal.

Dydyk teaches prior art image rejection mixers with essentially the same architecture and function of Wilson where the RF and LO signals as inputs are permitted to change. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Wilson modified in the manner taught by Dydyk would yield an alternative but functioning circuit.

Conclusion


4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. McGeehan et al. (U.S. Patent 5,950,119) discloses an image reject mixer with emphasis to correct and phase imbalance in the circuit to maximize image rejection. Atherly et al. (U.S. Patent 5,140,198) discloses an image canceling mixer circuit on an integrated circuit chip.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blane J Jackson whose telephone number is (703) 305-5291. The examiner can normally be reached on Monday through Friday, 8:00 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (703) 305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BJJ


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